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ENTOMOLOGICAL NEWS

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Doctor William Procter (1872–1951)

Doctor William Procter, distinguished scientist, died suddenly and unexpectedly in West Palm Beach, Florida, April 19, 1951. Doctor Procter was born in Cincinnati, Ohio, on September 8, 1872, the son of Harley Thomas and Mary Elizabeth Sanford Procter. His grandfather founded the Procter and Gamble Company in 1837.

Much of Doctor Procter's boyhood was spent in the Berkshires of western Massachusetts. He graduated from Phillips Exeter Academy in 1891, and from Yale University with the degree of Ph.B. in 1894, having specialized in chemistry and business. Between 1895 and 1897 he took an extended trip around the World, visiting Japan, China, India, and many other countries. He was a graduate student in the Sorbonne (Paris, France) in 1896–1897. For the succeeding twenty years he was engaged in business, chiefly in the field of railroad organization and securities. Later he became actively associated with, and a director of, the Procter and Gamble Company.

In 1917 Doctor Procter gradually relinquished business and began graduate work in zoology at Columbia University, continuing until 1920, but never working toward a higher degree. His interests were chiefly in genetics, embryology and protozoology, he being associated with men such as Wilson, Morgan, Calkins, Huettner, Sturtevant, and others of the brilliant group then in the Department of Zoology at Columbia. It was this inspiring experience that influenced Doctor Procter to devote the remainder of his life to work in biology.

Ever since he was a boy of about 15, or in the mid-80's, the Procter family had spent nearly every summer on Mount Desert

Island, Maine, chiefly at Bar Harbor. In 1921 Doctor Procter established a research laboratory on the Island, at first in association with others at Salisbury Cove. Various disagreements led to his withdrawal from this association and instituting his own laboratory on his estate at Corfield, on Frenchman's Bay, about a mile north of Bar Harbor. Most of the early work of the laboratory was devoted to a study of the rich marine fauna of the Island, the results being published in a series of volumes mentioned later. Doctor Procter's fine work attracted the staff in biology at the University of Montreal, and in 1936 he was called to Montreal where he passed an examination and was awarded the degree of Doctor of Science. This same year he established "The Biological Survey of the Mount Desert Region, Incorporated."

It was in 1918 that the Boston Society of Natural History (later the New England Society) selected Mount Desert Island for detailed study of the insect fauna, and the curator of the collections, Charles W. Johnson, spent a portion of each summer on the Island until 1926. In that year, Procter and Johnson made elaborate plans for further study, but this was interrupted by Johnson's death in 1932. Doctor Procter then entered upon his work on the insect fauna of the Island with an unflagging interest and vigor. Parts of every year, usually from early May into October, were spent at the home at Corfield, and every part of the Island, including virtually every square foot, was combed for insects. The small station near Salisbury Cove called "Penikese" and the main laboratory at Corfield were the bases where much work was accomplished, by the running of light traps and other methods. As discussed in his publications, Doctor Procter constantly changed his light traps as to position, and color and intensity of the light, and these yielded a vast range of specimens and species.

Of the series of seven volumes, or parts, published in his survey, the first was by the late Charles W. Johnson who worked on the insect fauna of the Island. This was largely responsible for diverting Doctor Procter's interests from the marine to the terrestrial fauna. It is of interest to note that

this first volume on the insects of Mount Desert was dedicated to the late Professor Charles Henry Fernald, founder of the Department of Entomology at the now University of Massachusetts, in 1886, who was born on the Island on March 16, 1838. Parts 2 to 7 of the series were written by Doctor Procter, Parts 2 to 5 relating to the marine fauna, Parts 6 and 7 to the insects.*

In Part 7 of this series, Doctor Procter describes the 421 field stations that he had established and examined between 1927 and June 1945. Following the publication of this concluding volume, the study was continued and the number of field stations was further increased. In 1946, Doctor Procter had amassed records from the Island of no fewer than 349 families, 2,660 genera, and 6,578 species and subspecies of Arthropods, all but 200 of which were insects. Virtually all of these are represented in his personal collection. In this concluding volume on the insects, he dedicates the work as follows: "I have listed alphabetically the many persons who have shown their interest and kindness in giving me help of many kinds. To them I am profoundly grateful and, as mentioned elsewhere, I dedicate this volume to them as a mark of my appreciation." This list includes some 79 names. One name that was omitted inadvertently, since he was of the greatest help in the preparation of the work and is cited hundreds of times throughout the volume, is Doctor A. Edmund Brower, of Augusta, Maine. Doctor Brower was stationed on Mount Desert in the early and mid-30's and cooperated closely with Doctor Proctor both in collecting and in identification of the insects, particularly the Lepidoptera, and especially the Micros.

During his life Doctor Procter made many donations and contributions to various causes and to many persons, these never being publicized in any manner. Thus, during the difficult years

* Biological Survey of the Mount Desert Region. Part VI. The Insect Fauna, pp. 1–496, map, 11 figs., portrait of C. W. Johnson; 1938. (Includes 5,465 species and subspecies, Hexapoda and Arachnida.) The Same, Part VII. The Insect Fauna, pp. 1–566, map, 10 figs.; 1946. (Includes 6,578 species and subspecies.)

of the recent war he made substantial contributions to the Entomological Society of America, which enabled the Society to publish their "Annals" of the period with little or no reduction in size. He served on the advisory board of the zoology department of Columbia University, on the board of the Wistar Institute of Anatomy and Biology, as a trustee of the American Museum of Natural History, and in several other important capacities. Likewise he was a member of many scientific societies, both in America and abroad. In later years, and chiefly through his personal friendship with Doctor George A. Baitsell, of Yale University, he became very much interested in the Society of the Sigma Xi, contributing generously to its various Grants-in-aid, and particularly to RESA (The Scientific Research Society of America). This culminated in the establishment of the William Procter Prize for Scientific Achievement, the first award of which was made to Doctor Karl T. Compton at Cleveland, Ohio, on December 29, 1950.

Doctor Procter remained a bachelor until he was 38, when he married Miss Emily Pearson Bodstein on Feburary 3, 1910. Seldom has there been a couple more devoted and appreciative of the efforts of the other than Doctor and Mrs. Procter. A distinguished musician and French scholar, Mrs. Procter was invalided by arthritis for several years before her death at Bar Harbor on September 25, 1949.

Doctor Procter bequeathed his collection of insects, together with the cabinets, drawers, books and records appertaining thereto, to the University of Massachusetts. It will be maintained as a separate unit as "The William Procter Collection of Mount Desert Insects." In his will, Doctor Procter has specified that there be no additions made to this collection unless by specimens taken on Mount Desert Island, stating "My reason being that its great value is to show a biotic entity, and it has taken years of hard work to assemble same, though every hour one of pleasure."

Some of us were privileged to know Doctor Procter well and to appreciate his many splendid qualities. He was a most amazing combination of an outstanding man of business and

a keen entomologist. In one moment he might be discussing the purchase of the World whale oil supply for his Company, while at the next he would be in raptures over the capture of a microscopic beetle or other insect new to his collection. His knowledge of the habits and habitats of the Mount Desert insects was profound. The detailed record of the fauna of his beloved Island will long serve as his monument.

CHARLES P. ALEXANDER

The Tribal Position of Certain Genera of the Pyrgomorphinae (Orthoptera: Acrididae)

By JAMES A. G. REHN, Curator of Insects, The Academy of Natural Sciences of Philadelphia

The author recently completed a monographic analysis of the acridoid subfamily Pyrgomorphinae as found in Australia, which is to appear as a section of a comprehensive study of the grasshoppers of that continent, prepared at the request of, and to be published by, the Scientific and Industrial Research Organization of that Commonwealth.

In the course of this work, and that on other sections of the Acridoidea, it has been found necessary to examine numerous non-Australian genera to evaluate the relationships and possible origin of genera occurring in Australia. In doing this cases of faulty associations made in the past are frequently encountered. These are due in some instances to previous authors having lacked actual material of relevant genera, or at least of a sufficient representation to furnish a proper background for generalizations, while in other cases errors of judgment or interpretation have been responsible for conclusions which now prove to be unwarranted or unsound.

The genera placed in the pyrgomorphid "section Poecilocerae," or, as I prefer to regard it, the tribe Poekilocerini (*Poekilocerus* being the original spelling of the key genus), by the last critical analyst of the subfamily as a whole, Ignacio Bolivar in 1909,[1]

[1] Genera Insectorum, Acridiidae, Pyrgomorphinae.

included the Australian genera *Petasida* White, and *Monistria* Stål, the Burmese *Chlorizeina* Brunner, the Malagasy *Rubellia* Stål, the north African and South Asian *Poekilocerus* Serville, and the tropical African *Sphenexia, Stenoscepa, Cawendia* and *Humpatella,* all of Karsch. The key genus *Poekilocerus* has a type of distribution, i.e. across northern Africa, Arabia and parts of India, which is found in many palaeotropical genera of semi-arid or savannah environments. The Australian genera, both those included by Bolivar in 1909, and those since made known, are being discussed in the forthcoming monograph.

The Burmese genus *Chlorizeina* was described by Brunner in 1893,[2] but, as he states, was unknown in 1909 to Bolivar from material. The original description is relatively superficial and Brunner's figures sketchy. As he figured the male sex, this can be regarded as the type of *unicolor,* although we were not told from which of the two original localities it came, nor whether there were before Brunner more than a single male.

Since it was first described our knowledge of *Chlorizeina* has been but moderately amplified. In 1941 Ramme described and figured a second species, *C. elegans,* from Maymyo, Upper Burma,[3] and also he has given us a figure of the abdominal apex and cercal outline of the male sex of *unicolor* as understood by him,[4] from material taken at Hmaubi ("Hmawbi" in the London *Times* atlas), which is about twenty miles nearly due north of Rangoon, Burma, and at a very low elevation. In checking over unstudied series in the Academy collection I found a third species of the genus represented by both sexes from Kalaw, in the Southern Shan States of Burma, which I am describing elsewhere.

It is now evident to me that *Chlorizeina* is not a member of the Poekilocerini, but instead is an aberrant component of the Indo-Malayan tribe Tagastini ("Tagastae" of Bolivar). The genus

[2] Ann. Mus. Civ. Stor. Nat. Genova, XXXIII, p. 130, pl. V, figs. 51a and 51b. Based solely on *C. unicolor* Brunner, there described. The species was founded on both sexes from Palon, Pegu, Burma, and Bhamo, Burma.

[3] Mitt. Zoolog. Mus. Berlin, 25, heft 1, p. 36, text-fig. 13e, pl. XII, fig. 2. [♂; Maymyo, Upper Burma, elevation 800 meters.]

[4] Idem, p. 36, text-fig. 13u, pl. XII, figs. 1a and 1b.

has been compared with material of *Tagasta* and *Annandalea,* both of Bolivar, which were placed in that assemblage by that author. With these two genera *Chlorizeina* agrees in the dense and closely placed, in fact subattingent, longitudinal venation of the tegmina, instead of the more open, ramifying and usually less strict type of the Poekilocerini, in the appreciably, but not strongly, marked longitudinal carinulae on the dorsal face of the cephalic and median femora, in the definite and well developed supra-coxal lobe of the caudal femora, in the acute apices of the genicular lobes of the caudal femora, and in the distinct and regular pattern of the external paginae of the same, as well as their carinately defined ventro-external face. From the poekilocerine genera *Chlorizeina* differs in all of the above mentioned respects.

The Malagasy genus *Rubellia* Stål is represented by material of both sexes in the Academy series, and similarly it is not a member of the Poekilocerini, where for many years it has been placed. Instead it is clearly one of the tribe Sphenariini ("Sphenariae" of Bolivar), along with *Sphenarium* Charpentier, *Prosphena* Bolivar, *Chirindites* Ramme and *Yunnanites* Uvarov, with all of which it has been physically compared. While the alar organs are always more developed in *Rubellia* than in any of the other genera which have been placed in the Sphenariini, it is apparently more nearly related to the African *Chirindites* than to any of the other components, yet the two genera are widely separated from one another. In addition to many features of *Rubellia* which support the position here given, such as the basic fastigial structure, numerous details of the caudal femora and of the meso-metasternum, the virtually unarmed prosternum is a feature of the Sphenariini, and not of the Poekilocerini. While other tribes of the Pyrgomorphinae have unarmed prosterna, they are distinguished by numerous features not shared by *Rubellia.* I regard *Rubellia* as the most primitive and generalized of the genera of the Sphenariini, by reason of its possession of a fully alate phase in its alately dimorphic genotypic species *R. nigrosignata.*

Of the four tropical African genera described by Karsch, and which have been placed in the Poekilocerini, *Cawendia,* of which

several species are now before me, must certainly be removed from the Poekilocerini. Its exact assignment is as yet uncertain, but it cannot be retained in that assemblage. While no material is before me at this writing I have every reason to believe that of the three remaining genera *Sphenexia* and *Stenoscepa* may prove to be members of the Sphenariini, and not of the Poekilocerini. As to the remaining genus—*Humpatella* Karsch—material, and of both sexes, will be needed to place it with certainty, as the literature is of little use for so doing.

Summarizing, I do not believe the tribe Poekilocerini will be found present in Africa south of the range of the broadly north African *Poekilocerus*. Further it is my opinion that the latter genus and the Australian genera are all which can properly be referred to that tribe, and that no members of it will be found in truly humid sections of the Old World tropics. Also it would appear that the Sphenariini is a very old and widely spread tropical and subtropical assemblage, with its genera, which represent numerous subsidiary evolutionary lines, scattered over Farther India, extreme southern China, Madagascar, tropical Africa (but not Guinea forest areas), and various parts of the New World tropics and subtropics. The Tagastini is a dominant Indo-Malayan entity reaching from eastern India (Bhutan and Assam) to the Philippines and the Moluccas, and is represented in Farther India by three genera, i.e. *Tagasta, Annandalea* and *Chlorizeina*.

It is increasingly evident that the Pyrgomorphinae is a comparatively ancient group of grasshoppers, basically of a "Gondwanaland" type of distribution, possessing marked plasticity in certain features in numerous genera and species. Also it has earmarks of an ancient line, which has been able to maintain itself through the possession of particular faculties which presumably have survival value, as repugnatorial glands, "bleeding" ability, aposematic coloration, and in some genera and certain species intra-specific alar dimorphism. Further the possession of a vertically cleft fastigium, a character unique in the Acridoidea, is in itself evidence of the Pyrgomorphinae being a relatively long established line.

The Second Species of Psectrothrips (Thysanoptera: Thripidae)

By Lewis J. Stannard, Jr., Illinois Natural History Survey, Urbana, Illinois

The previously monobasic genus *Psectrothrips* was erected for a large thrips with a greatly elongated, *Ctenothrips*-like head outline. So remarkable is the appearance of this species, the genotype *delostomae* Hood, that, in the process of placing the new short headed species herein described, I nearly ruled out the possibility that it might belong in *Psectrothrips*. Not only are the two species quite different in gross appearance but also seemingly in their habits and geographic locations. Both species live isolated from one another, *delostomae* in Peru and *beckeri* sp. nov. in Honduras; and as far as is known, both frequent different host flowers, *Delostoma dentatum* and *Cornutia grandifolia*, respectively.

Actually, however, as will be pointed out, the structural differences of the two species are not of great magnitude despite first impressions. Also their present isolation is not extremely great for the two home ranges are on land masses that were connected possibly in the Cretaceous and almost certainly in the Oligocene, Miocene, and Pliocene (Simpson, 1950). Then, too, their life zones have always been tropical, and their hosts belong in the same plant order according to Johnson (1931), or in two closely related orders according to Bessey (1915).

Because of the prolonged head form of *delostomae*, *Psectrothrips* was originally considered to be related to *Ctenothrips* which has a head similarly shaped. Now with the discovery of the second species with another type of head, it is necessary to add the genera *Frankliniella* and *Taeniothrips* and others as relatives. Certainly the head of *beckeri* would be difficult to separate from some of the species in the two aforementioned genera in shape and in details of setal arrangements and sculpture. Besides, *Taeniothrips* parallels *Psectrothrips* in containing species with radically divergent heads such as *T. orionis*, long with bulging eyes, versus *T. simplex* with its short transverse head. Perhaps the long head of *delostomae* is in part an expression of heter-

ogonous growth correlated with the factors that have produced a larger body as well.

In adding *beckeri,* the following six characteristics now seem to me to be the principal ones for the recognition of *Psectrothrips:*

1. Antennae 9 segmented. See Hood, 1937, p. 265, fig. 2, c.
2. Prothorax with but a single pair of very long setae situated one on each of the posterior angles, fig. 1. Also see Hood, 1937, p. 265, fig. 2, a.
3. Abdominal tergum 7 with a complete or nearly complete, even comb of setae across the posterior border in addition to the comb on segment 8 and the partial lateral combs on several other segments. See Hood, 1937, p. 265, fig. 2, b.
4. Fore wings with a nearly even and closely set row of setae on both longitudinal veins, as similarly found in *Frankliniella.*
5. Metanotum hexagonally reticulate, fig. 2, somewhat as in *Isoneurothrips* and *Ctenothrips.*
6. Abdominal tergum 9 of the males with a pair of stout thorn-like spines, fig. 3, similarly as in males of *Frankliniella* and others.

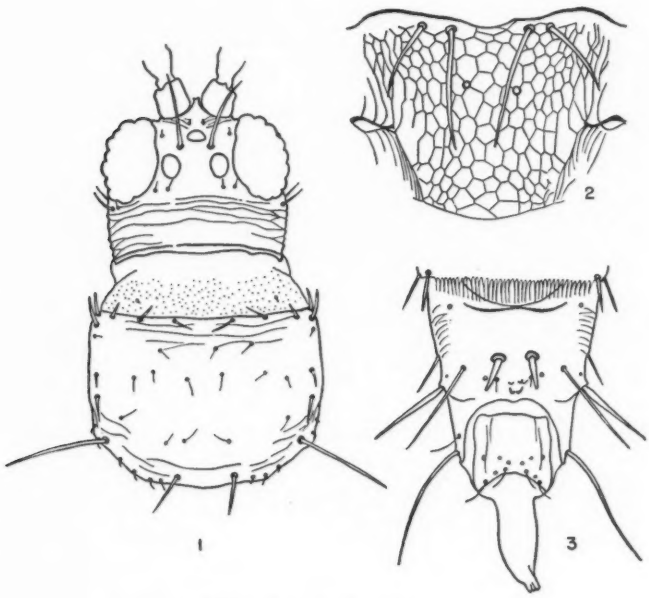
Most of the other characters mentioned in the original description (Hood, 1937) apply equally to the two species. The above new concept, however, deemphasizes the large size, the long head, the pair of strong antero-lateral prothoracic setae, and the noninterruption of the seventh abdominal posterior comb. Structures of the latter kind serve to distinguish only the genotype. *Psectrothrips* can be set apart from all of the genera in the Thripidae by the combination of three characteristics, i.e., the antennal form, the abdominal combs, and the prothoracic setation, although these same characters individually may be found scattered in a number of genera.

Psectrothrips beckeri sp. nov.

In naming this species, a distinctive thysanopteron, I am pleased to have the opportunity to honor my friend Mr. Edward C. Becker, a coleopterist, who went far out of his way to bring back one of the finest collections of thrips ever to come from

Central America. This species is but one of the many in the Becker Collection which was donated to the Illinois Natural History Survey.

Female (macropterous).—Length of body, exclusive of antennae, distended, nearly 2 mm. Color almost entirely darkish



Psectrothrips beckeri sp. nov.

Fig. 1. Dorsal aspect of head and prothorax.
Fig. 2. Reticulations of metanotum.
Fig. 3. Terminal abdominal terga of male.

brown underlain with yellowish subdermal pigments, pedicel of third antennal segment, extremities of legs and lateral portions of metathorax lighter to nearly yellow, setae blackish brown, forewings grayish brown with a lighter streak between the veins and lighter at the base beyond the scale, hind wings pale gray with a median longitudinal dark stripe. Head as in fig. 1, wider (through eyes) than long, postocular setae reduced to minute

size. Prothorax as in fig. 1, differing from *delostomae* in that the two pairs of antero-lateral setae are about the same length (subequal to the mid laterals). Mesonotum with transverse striations. Abdominal sterna without median setae in addition to the setae along the posterior margin. Seventh abdominal comb interrupted in the middle in the holotype specimen but complete in some of the paratypes.

Male (macropterous).—Length of body, exclusive of the antennae, distended, about 1.6 mm. Generally similar to female except somewhat lighter in color especially in the legs. Oblong glandular areas on the forward median region of the abdominal sterna; by contrast, males of *delostomae* (according to Priesner's key, 1949) possess square shaped glandular areas.

Holotype.—Female; La Ceiba, HONDURAS; July 9, 1949; (E. C. Becker); on *Cornutia grandifolia* (determined by Dr. Paul C. Standley for Mr. Becker).

Allotype.—Male, same data as above.

Paratypes.—7 ♀ and 12 ♂, same data as above, mounted on slides; 6 ♂, same data as above except May 14, 1949, preserved in alcohol.

The holotype, allotype and a portion of the paratypes are deposited in the Illinois Natural History Survey. The remaining paratypes will be distributed to the California Academy of Sciences, the Philadelphia Academy of Natural Sciences, the United States National Museum, and to the Collection of Prof. Dr. Hermann Priesner of Cairo, Egypt.

All of the 21 specimens in the mounted type series show considerable variation in the number of setae of each of the veins of the fore wings and in the extent of the comb on the seventh abdominal segment. No individual of either sex bears the same number of vein setae on the right and left forewings. These vein setae range in number from 22 to 16 on the anterior vein and from 17 to 11 on the posterior vein. Generally the tendency is for a complete seventh abdominal comb although the median area of the comb occasionally lacks setae, particularly in the female.

Except for the comparative remarks made in the description and in the introduction, no further analysis of the two species can be made at this time since I have never seen specimens of

delostomae. The published illustrations of these species provide sufficient reference points for their separation one from another.

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A New Mite from Nests of the Wood Rat, Neotoma micropus

By R. B. EADS and B. G. HIGHTOWER, State Department of Health, Austin, Texas

Mites taken from nesting material of the Baird wood rat, *Neotoma micropus,* represent a new species of the genus *Androlaelaps* and the description is presented in this paper.

Androlaelaps johnstoni, n. sp.

Female. (Plate I, Figs. A, B, C, D.) A light brown mite, small for this genus, elongate-oval in outline and with faint shoulders. Average measurements in microns of 3 specimens: total length, exclusive of gnathosoma, 528; total width of body at widest point, 349; length of dorsal plate, 494; width of dorsal plate, 308; length of genitoventral plate to the anterior border of the anal plate, 43. The setae are of moderate length and thickness.

Sternal plate reticulate, slightly concave on anterior margin, posterior margin almost truncate. Lateral margins strongly

concave, with postero-lateral corners projecting between coxae II and III. First pair of sternal setae on anterior border, second pair level with the middle of coxae II, the third pair level with anterior third of coxae III; a pair of prominent, slit-like pores placed immediately below and between the first pair of setae. Presternal area with a distinct pair of transversely striated presternal plates. Endopodal plates indistinct; endopodal setae not noticeably longer than the third pair of sternal setae. Genitoventral plate expanded beyond coxae IV, and bearing the typical single pair of genitoventral setae; genitoventral plate extends closer to the anal plate than the total length of the anal plate. Approximately 14 setae situated on the non-sclerotized lower half of the venter.

Two pairs of metapodal plates present, one pair elongate and a smaller pair circular in shape. Anal plate roundly triangular, measuring approximately 78 microns in length by 76 microns in width; anal setae subequal in length. Peritreme extends beyond coxa I to slightly beyond coxa IV, stigma situated near the anterior margin of coxa IV.

Leg II shorter and stouter than legs I and IV, with leg III somewhat shorter than leg II. Coxae I, II and III with two slender setae, coxa IV with one. Characteristic spurs on femora, genu and tibia of leg II; large spur of femora II smooth with a bluntly rounded apex, flanked by a stout spine and two large setae (Fig. D); tarsus II with two stout median spines on basal half and three stout bristles toward apex (Fig. C).

Epistome concave in outline with smooth margins, hypostome with 6 rows of denticles, each row consisting of 4 to 6 teeth; chelae quite short, fixed chela with one large and one small tooth, plus a small, uninflated seta near the apex; movable chela with a minute tooth near the middle.

Male. Unknown.

Types. The holotype female was taken from nesting material of the Baird wood rat, *Neotoma micropus,* by G. C. Menzies and B. G. Hightower, Gaines Co., Texas, October 5, 1950. Two paratype females were taken from a *N. micropus* nest by B. G. Hightower, Zavala Co., Texas, September 6, 1950. The holotype has been deposited in the United States National

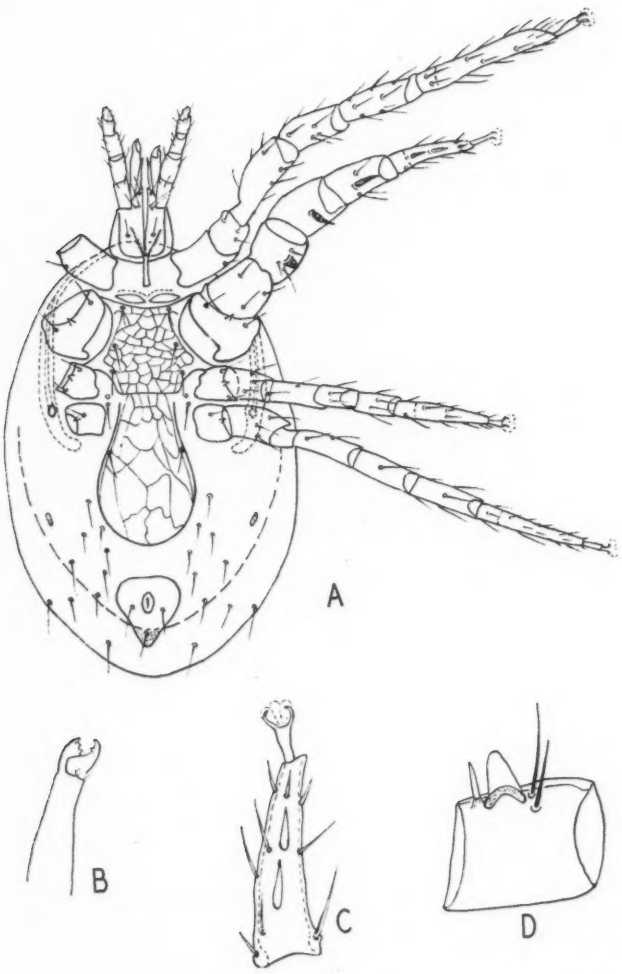

PLATE I

Androlaelaps johnstoni, new species. FIG. A. Female venter. FIG. B. Female chelicera. FIG. C. Female tarsus II. FIG. D. Female femur II.

Museum and the paratypes retained in the collection of the Texas State Department of Health.

Remarks. The small size, minute chelae, and the presence of 2 stout spines on tarsus II, in addition to the usual spurs of the femora, genu and tibia on leg II, serve to distinguish this species from other known *Androlaelaps*. The mite is named for Dr. H. G. Johnston, Head of the Department of Entomology, Texas A. & M. College, who gave many of us our first introduction to insect taxonomy.

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Current Entomological Literature

COMPILED BY R. G. SCHMIEDER.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

This list gives references of the year 1951 unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

For other records of general literature and for economic literature, see the Bibliography of Agriculture, Washington, and the Review of Applied Entomology, Series A, London. For records of papers on medical entomology see Review of Applied Entomology, Series B.

NOTE: The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the List of periodicals and serials published in our January and June issues. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

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